CENTRE FOR ENVIRONMENTAL DATA ARCHIVAL (CEDA) CURRENT DATA HOLDINGS (August 2010)

The Centre for Environmental Data Archival (CEDA) delivers the **British Atmospheric Data Centre (BADC)** for the National Centre for Atmospheric Science (NCAS) and the **NERC Earth Observation Data Centre** for the National Centre for Earth Observation (NCEO) and the **IPCC Data Distribution Centre** for the Intergovernmental Panel on Climate Change (IPCC). CEDA is sited at the Rutherford Appleton Laboratory (RAL) in Oxfordshire, part of the Science and Technology Facilities Council (STFC). CEDA supports the atmospheric and earth observation science communities in the UK and abroad through the provision of data management and discovery services, and continues to develop tools and services to aid data preservation, curation, discovery and visualisation.

While CEDA-BADC holds data on the atmosphere and related data sets from satellite instruments, computer models, ground-based, aircraft and balloon-borne instruments, CEDA-NEODC archives remotely sensed data of the surface of the Earth acquired by satellite and airborne sensors, and related datasets, e.g. derived products, in-situ measurements and model output.

All data held by CEDA (BADC and NEODC) are available via the internet, either via direct download from the web, or via FTP. Although most of the data are publicly available, a significant proportion of the data are restricted, either to UK users, or to specific users who are registered and authorised. These restrictions are generally associated with the requirements of the data providers. CEDA data sets are detailed within a metadata catalogue which can be searched by keyword. Software and interactive tools are provided to assist in the manipulation of the data and extensive information is provided on the data collection procedures, formats, data quality, contact names and references to journal papers (metadata collection).

In 2009/2010, CEDA delivered in excess of 100 TB of data in 17 million files to nearly 3000 distinct users. CEDA archives 256 data sets to date.

This report presents current key data holdings at CEDA data centres, namely BADC and NEODC, and briefly highlights major services provided by CEDA for its users.

1. CEDA-BADC DATA HOLDINGS

The BADC is the NERC designated data centre for the atmospheric sciences. It is the primary archive for atmospheric data produced by NERC-funded scientists and it also provides UK researchers with access to a wide range of third party atmospheric data sets over the Internet. The BADC is one of the constituent centres of NERC's National Centre for Atmospheric Science (NCAS) whose researchers are the primary research community that the BADC activities support. In addition the BADC aims to facilite the wider research community, including research from the engineering (in particular renewable energy), medical and biosphere communities.

The data held by BADC tall naturally into three types:

1) **Data sets produced by NERC funded programmes** e.g. MST radar, FAAM aircraft, Directed Modes Programmes such as FREE, RAPID, etc.

2) **3rd party data sets required by a broad section of the research community** e.g. meteorological data from the Met Office and the European Centre for Medium Range Forecasting (ECMWF), and the University of East Anglia Climate Research Unit (CRU) .

3) **3rd party data sets available from various EU projects** (e.g. CLAUS, GERB, VIRTEM) and **NASA programmes** e.g. UARS instruments, STEP, SAGE II&III, SPADE, GEDEX and others) are also held at the BADC for the convenience of UK users.

The most comprehensive listing of BADC data can be found at http://badc.nerc.ac.uk and in Annex 1 page 15 to supplement this report. The major BADC data holdings are outlined below.

1.1 Major current data sets produced by NERC funded programmes

The BADC holds atmospheric data sets produced from NERC funded programmes (e.g. Directed modes as well as NERC Services and Facilities e.g. MST Radar) and it provides the science support associated with the archiving of those data products to data providers and the user community.

Data sets produced from NERC Directed Modes include:

- **QUEST (**Quantifying and Understanding the Earth System**)** aiming to substantially improve predictions of global environmental change.

- **UK-SOLAS** (Surface Ocean / Lower Atmophere Study): A five year programme to advance understanding of environmentally significant interactions between the atmosphere and ocean, focusing on material exchanges that involve ocean productivity, atmospheric composition and climate. Support to SOLAS continues in the form of provision of trajectories to Cape Verde Observatory and ongoing archival of Cape Verde data.

- **FREE** (Flood Risk for Extreme Events) support research into flood prediction minutes to weeks and seasons to decades ahead. As part of the Density Forecasts FREE project, UK historical rainfall records over the period 1866-1968 has recently been archived at the BADC.

- **APPRAISE** (Aerosol Properties, Processes and Influences on the Earth's Climate): The APPRAISE programme looks at the science of aerosols and their effects on climate, as understanding atmospheric aerosols is one of the most important ways we can improve models of likely climate change, particularly at regional scales. Archival of GLOBAER data (satellite products) as part of the APPRAISE-ADIENT campaign was recently completed.

- **RAPID-Watch:** RAPID-WATCH builds on the RAPID programme to deliver a decade-long (2004-2014) time series of observations of the Atlantic Meridional Overturning Circulation (MOC).

Past NERC thematic programmes also include **ACSOE** (Atmospheric Chemistry Studies in the Ocean Environment, **URGENT** (Urban Regeneration and the Environment), **UTLS-Ozone (**Upper-Troposphere-Lower-Stratosphere ozone), **COAPEC** (Coupled Ocean-Atmosphere Processes and European Climate), **Polluted Troposphere**, **CWVC** (Clouds, Water Vapour and Climate) – the latter produced the GRAPE data set, a global cloud and aerosol data set using a state-of-the-art physical retrieval of the entire duration of the Along Track Scanning Radiometer 2 (ATSR-2) mission (aboard ERS-2). The dataset has been extended to include data from the Advanced ATSR ,(A)ATSR, on board Envisat in the context of NCEO, the National Centre for Earth Observation. GRAPE is stored at the BADC.

Data sets produced by other NERC funding types (e.g. Consortium grants, IPY) include **ACTIVE** (Aerosol and Chemical Transport In Tropical Convection), **OP3** (Oxidant and Particle Photochemical Processes above a South-East Asian tropical rain forest), and **RONOCO** (ROle of Nighttime chemistry in controlling the Oxidising Capacity of the AtmOsphere) and **COBRA (**Impact of COmbined iodine and Bromine Release on the Arctic atmosphere) and **ABACUS (**Arctic Biosphere-Atmosphere Coupling at multiple Scales).

Data produced from NERC funded national capability facilities (either through NCAS or NERC's Services and Facilities) are also archived at the BADC. They are mainly as follows:

- **FAAM:** The FAAM (Facility for Airborne Atmospheric Measurements) puts at the scientists' disposal a large atmospheric research aircraft (the BAE-146-301 aircraft) through a scheme of project selection and combined funding. The BADC is the FAAM designated data centre. Core and non-core data from over 540 flights have been received and archived at the BADC since 2004.

- **MST Radar Facility**: The Mesosphere Stratosphere Troposphere Radar facility is situated in Wales but the data are archived at the BADC. High resolution measurements of the horizontal and vertical wind velocities in the atmosphere in the regions of 2-25 km and 75-85 km are obtained with a height resolution that is adjustable, and generally 12 minute periods are averaged in the BADC archive. Supplementary surface meteorological measurements fromt eh facility are also archived.

- **HIRDLS on AURA:** HIRDLS is an infrared limb-scanning radiometer, carried on the Aura mission, part of the NASA's EOS programme. It is designed to sound the upper troposphere, stratosphere, and mesosphere to determine temperature; concentrations of atmospheric chemicals and aerosols; and the locations of polar stratospheric clouds and cloud tops. HIRDLS data is archived at the BADC since 2004.

- **Chilbolton Facility for Atmospheric and Radio Research (CFARR) :** CFARR operates a number of ground based and remote sensing instruments a the Chilbolton site, Hampshire. While data from some instruments are archived only when they are run as part of a campaign, data are also archived from a suite of continually running instruments.

1.2 Key 3rd party meteorological data sets

THE NERC – UK MET OFFICE DATA AGREEMENT: A formal agreement has been reached between NERC and the UK Met Office in which requests for meteorological data for NERC funded atmospheric research are coordinated by the BADC. This arrangement is designed to increase efficiency and avoid duplicate requests. Where there is sufficient demand, the BADC provides a service for the bulk acquisition and distribution of data (e.g. AFRICA-LAM and Air Quality Unified Model (AQUM) runs to support studies of NCAS Weather researchers).

- **Met Office MIDAS Land Surface Stations Data:** consisting of daily and hourly surface weather observations from the Met Office UK station network (approximately10,000 sites)

and synoptic observations from worldwide stations. UK daily and hourly data are available from 1853-present. Global synoptic observations are available from 1974 to date. The data are updated monthly. Upper air CLIMAT messages and surface long term climate data have recently been added to the MIDAS archive at the BADC. This is the most popular data set and so a great deal of effort has gone into documentation (including an on-line station catalogue and webguides or video tutorials) and providing a user-friendly data extraction tool (Data Extractor Service).

- **Met Office MetDB data:** MIDAS land surface station data undergo a level of quality control delaying delivery to the research community and are of limited scope. To assist in early delivery of observation data from a wider collection of sources data collected by the Met Office as part of the analysis stream for NWP are obtained from the Met Office's MetDB system. These include land and sea surface meteorological observations, upper air reports and some satellite data. These arrive at the BADC in near real time, offering the ability to supply data for campaign support purposes, although these data are only ordinarily available to the research community 2 days after acquisition to protect Met Office commercial interests.

- **Met Office Upper Air Data**: Upper air data at standard resolution from 160 UK and European radiosonde stations from 1990-present and 740 global stations from 1996-present. High resolution data from a number of 10 UK stations from the 1990's onwards are becoming available as data are made available from the Met Office. Additional upper air observations from the Met Office's wind profiler network are archived as a separate dataset within the BADC.

- **Met Office Rain Radar Products (NIMROD):** NIMROD is a fully automated system for weather analysis and nowcasting based around a network of C-band rainfall radars. The BADC holds the fine-resolution analyses of rain rate for the UK and Europe (5 or 15 minutes resolution on a 1km and 5km Cartesian grids) from late 2002, updated daily. Images are available for the UK and neighbouring European countries.

- **Met Office Hadley Centre Climate Data**: A number of climate data sets have also been made available by the Met Office via the Hadley Centre, some of which contain a variety of parameters.
    - HadCET: The Central England Temperature Time Series. (1659-present, updated monthly)
    - HadISST: Global sea-ice coverage and Sea surface temperature (1870-present, updated monthly)
    - HadSST2: Uninterpolated sea surface temperature (1850-present, updated monthly)
    - HadAT: Global radiosonde gridded temperature anomalies (1958-present, updated monthly)

- GMSLP/HadSLP1: Global Mean Sea Level Pressure (1871-1998)

- **Met Office Model Data:**
  - **Operational NWP Data Products (Unified Model)** from 2000-present: In late 2000, the BADC began routine acquisition of operational numerical analyses and forecast data from the UK Met. Office Unified Model. The data set consists of global, mesoscale (up to 2007) and North Atlantic European (NAE, 2007-onwards) fields of various meteorological parameters on a number of vertical levels. Both analyses and forecast data up to 6 hours (in some cases) are available (Oct. 2000 – present, updated daily). These have been used as input data for on-line services provided by the BADC, such as the MCIP Dump service.
  - **NWP Assimilated data** from 1991-present. These are used routinely for long term comparison studies with satellite observations. Updated daily.
  - As part of the DEFRA funded Climate Impacts LINK Programme, the BADC have also extracted numerous **climate model data sets** from the UK Hadley Centre and made these easily accessible to the research community. These are of particular interest to those researchers investigating the impacts of climate change, and are a BADC resource which would otherwise be extremely difficult for them to access. These include:
    - HadCM3 Model data for a large number of climate change experiments and control runs.
    - HadCM3c Model data, which contains a detailed carbon cycle model.
    - HadGEM Model data from the Met Office Hadley Centre Global Environment Model (versions 1,2 and AO)
    - HadRM3 data set, which contains output from the HadRM3P variant of the MOHC Regional Climate Model (HadRM3), including the 16 member ensemble experiment data which formed the basis of the UK Climate Projections 2009 (UKCP09) report.
    - Output from earlier versions of some models (HadCM2, HadRM2).

- **ECMWF Operational Analyses:** Both spectral (T106) and Gaussian (N80) data are obtained daily from ECMWF 10 days following analysis time. Regular gridded data at 1.125 and 2.5 degrees resolution are also archived. Data are on surface, model and pressure levels covering March 1994 to present.

- **ECMWF ERA Re-analysis data:** The ECMWF Reanalysis ERA-15, ERA-40 and the latest ERA-Interim data sets are all archived at the BADC. These span 1979-02/1994, 1957-08/2002, 1989-present respectively.

- **ECMWF Near-real-time Data**: A number of forecast and analysis data sets are obtained within the usual 10 day embargo period required by ECMWF in order to support field

campaigns (special permission is required for access to these data products). ECMWF Near-real-time data have recently been provided for the ADIENT campaign as part of the APPRAISE directed mode, for the TROCCINOX campaign and for the Eyjafjallajokull volcanic ash plume event in the UK last April 2010.

- **CRU TS3.0:** The BADC holds the preliminary highly popular Climate Research Unit (CRU) TS3.0 data sets for the period 1901-2006 (global coverage). TS (time-series) data sets are month-by-month variation in climate over the last century or so. These are high-resolution (0.5x0.5 degree) grids. They allow the comparison of variations in climate with variations in other phenomena. A new version is expected soon.

1.3 Other major 3rd party data sets

A number of large chemistry data sets hosted in the U.S. are mirrored by the BADC to facilitate UK access to these data sets (and minimise trans-Atlantic internet traffic), namely:

- **NDACC:** The Network for the Detection of Atmospheric Composition Change (formerly known as NDSC) consists of a network of ground-based observation stations of the stratosphere. Their data are updated nightly. European users can gain access to this data by getting permission through the NDACC site in the U.S., and then carry on to obtain the data from the BADC.

- **OMI:** Ozone Monitoring Instrument (onboard AURA) data products including ozone, aerosol and reflectivity are routinely archived at the BADC since August 2004 (daily). The Total Ozone Monitoring Spectrometer (TOMS) data and total ozone map images are also available for the entire operational period 1978 to 2006.

- **UARS**: Level 2 and 3 products from the CLAES, ISAMS, HALOE and MLS instruments aboard the Upper Atmosphere Research Satellite (1991-2005) are archived at the BADC.

Other satellite atmospheric chemistry data sets available at the BADC include **SAGE II and SAGE III (**Stratospheric Aerosol and Gas Experiment data products for the period 1984 through to 2006), and the **Meteosat Second Generation (MSG)** data, updated daily from the Met Office.

Other third party data sets include

- **CLAUS:** The EU funded Cloud Archive User Service project produced a long time-series of three-hourly global window channel thermal infra-red images of the Earth. The CLAUS archive currently spans the period 1st July 1983 - 30th June 2006.

- **CORRAL:** In partnership with the Joint Information Systems Committee (JISC), the BADC stores the UK Colonial Registers and Royal Navy Logbooks (CORRAL) images, spanning the period 1669-1985.

- **Various past NASA campaigns and data sets on CD-ROMs e.**g. AAOE-87, AASE, ASHOE, MAESA, STEP, ISLSCP-I/II, WLSTA, ERBE etc.

2. CEDA-NEODC DATA HOLDINGS

The NERC Earth Observation Data Centre (NEODC) is NERC's designated data centre for earth observation science and as such it is tasked with the acquisition, archiving and provision of access to remotely sensed data of the surface of the Earth acquired by satellite and airborne sensors. NEODC also provides dedicated support and services to NERC's National Centre for Earth Observation (NCEO) and its science themes. The NEODC also ensures that adequate and effective stewardship is accorded, as appropriate, to other Earth Observation (EO) data acquired by the NERC, so that all such data are managed as a valuable resource for the UK science base and the wider community concerned with environmental research, survey and long-term monitoring.

Similarly to its sister data centre, the BADC, the data held by NEODC are data sets produced by NERC funded programmes (NCEO in particular) and 3rd party data sets required by a broad section of the research community.

The most comprehensive listing of NEODC data can be found at http://neodc.nerc.ac.uk and in Annex 2 page 21 to supplement this report. The major NEODC data holdings are summarised below.

The most popular data set at the NEODC is the data set produced by the NERC funded Airborne Research and Survey Facility (ARSF).

The NERC Airborne Research and Survey Facility (ARSF) provides the UK's environmental science community with aerial photography data (using a digital or analogue camera) and hyperspectral imagery from the Compact Airborne Spectrographic Imager (CASI), Airborne Thematic Mapper (ATM) and Specim AISA Eagle & Hawk instruments onboard a Dornier 228 aircraft. The NEODC holds the entire archive of ATM, CASI, Eagle and Hawk data acquired by the NERC ARSF, and LiDAR data for sites flown using the sensor. ARSF data are available from the NEODC to the wider community (following an embargo period of one year for peer review).

NEXTMap Britain Digital terrain mapping of the UK, produced by Intermap**,** is a data set which the British Geological Survey (BGS) acquired for NERC. This digital terrain model was derived from airborne Interferometric Synthetic Aperture Radar (IFSAR), enabling large areas of the country to be covered rapidly and at very high spatial resolution. The data set covers all of England, Wales and Scotland. NEXTMap is archived at the NEODC for the use of NERC scientists outside of BGS and CEH (Centre of Ecology and Hydrology) – BGS and CEH have made their own arrangements for internal distribution of the data. Under the Intermap-NUI-NERC agreement, NERC funded researchers must complete and abide by an End User License Agreement (EULA) before being individually granted access to the data which will be used for a specifically described project.

Datasets produced in NCEO are archived at the NEODC:

- Primary production, plankton and ocean optical properties derived from SeaWiFS data produced by NCEO scientists at Plymouth Marine Laboratory
- Fire radiative power data from MSG SEVIRI observations, developed by NCEO scientists at King's College London
- Atmospheric profiles retrieved from Envisat-MIPAS at the University of Oxford
- Air-sea carbon exchange products derived from TOPEX by NOC, Southampton

Satellite data from the European Space Agency and Eumetsat are stored at the NEODC for the convenience of UK users.

- **(A)ATSR multimission:** In partnership with ESA, the UK Department of Energy and Climate Change, NERC and STFC/RAL, the NEODC produced a 15-year archive of high-quality sea-surface temperature and image products from the (A)ATSR (Advanced Along Track Scanning Radiometer) series of instruments in a common format. By a NERC-ESA agreement, this data set is restricted to UK academic use or ESA Cat1 project holders only.

- **ENVISAT satellite data sets:** The NEODC has been routinely archiving the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) L1B (emission spectra) and L2 (retrieved quantities) data since 2002. MIPAS provides simultaneous and global measurements of the middle atmosphere dynamics, radiation budget and chemical composition, and monitors stratospheric ozone and CFCs. The Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY) and Medium Resolution Imaging Spectrometer (MERIS) L1B (radiance) and L2 (retrieved geophysical parameters) data archive spans the period 2002-2010. In accordance with an agreement between ESA and NERC, ENVISAT data is also restricted to UK academic use or ESA Cat1 project holders only.

- **EPS Metop satellites data sets**: The EUMETSAT Polar System (EPS) Metop satellites carry on board a set of state-of-the-art sounding and imaging instruments that offer improved remote sensing capabilities to both meteorologists and climatologists. The NEODC holds the Global Ozone Monitoring Experiment–2 (GOME-2), Infrared Atmospheric Sounding Interferometer (IASI) and the Advanced Very High Resolution Radiometer (AVHRR/3) data for distribution to all (Conditions of use apply).

- **Landsat data from NASA:** The NEODC holds subsets of Landsat 4 and 5 data as well as Landsat 7 ETM+ data from NASA. Landsat data is widely used in many fields including Geology, Agriculture, Resource Management, Climate analysis etc. Landsat data is restricted to academic research use only.

3. CEDA MAJOR SERVICES

As well as the data holdings, the CEDA provides the following key services to the research community:

CEDA User Support: The CEDA Helpdesk Service supplied dedicated support for user queries and handles dataset applications for access to restricted data. A software package is used to distribute, track and analyse queries efficiently. CEDA continues to provide prompt and effective support services to the user community at a high priority level.

CEDA Data Management Support: CEDA provides data management framework to the atmospheric and Earth observation communities where data are to be archived at one of the CEDA data centres. This includes the provision of a Data Management Plan to set up a coherent approach to data issues pertaining to experimental campaigns, the creation of a high quality documented data archives, appropriate data support to the data users and creators (e.g. support for file formatting, secure data uploading and downloading procedures, conditions of access, mailing lists, visualisation tools (e.g. event log mapping tool), and the provision of additional data (e.g. near-real time meteorological fields and products from the Met Office and the ECMWF, acquisition of third party datasets). A science support information tool has also been developed to allow CEDA staff to more effectively scope and track the data management activities for the various NERC programmes.

CEDA Document Repository: This service for *grey literature* primarily concerning Earth observation and the atmospheric sciences. The content is publicly available, with no need to register.

BADC WWW Trajectory Service: A web based interface to a trajectory model that is very popular with the users. The service provides a quick look facility for viewing the results as well as the interface to the model itself. This service has already been used to support several experimental campaigns (ADIENT, TROCCINOX, Eyjafjallajokull volcanic ash plume, CROSEX, etc).

BADC Data Extractor and GeoSPlAT: The BADC Data Extractor provides a web-interface that allows users to define and extract subsets from a number of BADC data sets in space and time (e.g. Met Office MIDAS, some ECMWF data, HadCM3 data, etc) and to create an online plot or animation via the GeoSpatial Plotting and Animation Tool (GeoSPlAT). An improved service to replace the Data Extractor Service, the CEDA Web Processing Service (WPS) is currently being developed and should be released in the coming months.

NEODC Interactive Map: The NEODC Interactive map allows web users to search for and view data sets (ARSF, Landsat, NEXTMap) in a spatial context. By clicking on individual items, associated metadata is revealed and in many cases it gives direct access to the archive for registered

users.

CEDA data visualisation service: The CEDA visualisation service allows gridded datasets in CF-netCDF format to be visualized, plotted and overlaid, and plots and data to be extracted for download. This service was initially developed in the context of NCEO (the National Centre for Earth Observation), and will continue to be improved during the current year.

4. FUTURE DATA HOLDINGS

CMIP5 -will be the largest of the future data sets. The output from this coupled model intercomparison project will form a major part of the next IPCC report (AR5).

Africa-LAM and Air Quality Unified Model (AQUM) runs - to support case studies of NCAS Weather researchers.

HadRM3-PPE - Data from the Hadley Centre Regional Model UKCP09 ensemble runs for use by the PRECIS group at the Hadley Centre and the wider Climate Impacts community, and also "full" domain data.

HadGEM1 -Extension to the existing control run data held in the archive, requested by NCAS Climate researchers.

MARS Climate Data-Reanalysis data sets from the Mars Global Surveyor Thermal Emission Spectrometer (MGS TES) instrument.

AMPS Antarctic data set- Antarctic MM5 Mesoscale Model Forecasts from the Antarctic Mesoscale Prediction System (AMPS), requested to support the work of NCAS Weather.

Met Office Spherics data

NCEP 20th Century Re-analysis

(A)RC sea surface temperatures

(A)ATSR aerosol products

GOES Fire Radiative Power

Cryosat Level 3 data

UK Solar System Data Centre: CEDA has also very recently taken charge of the UK Solar System Data Centre (UKSSDC). The UKSSDC provides a central archive and data centre facility for Solar System science in the UK. The facilities include the World Data Centre for Solar-Terrestrial Physics, Chilton and the Cluster Ground-Based Data Centre. The UKSSDC supports archives for the whole UK solar system community encompassing solar, inter-planetary, magnetospheric, ionospheric and geomagnetic data. The UKSSDC is also based at Ral Space, STFC Rutherford Appleton Laboratory in Oxfordshire. Procedures are now engaged to integrate this latest addition to the CEDA group infrastructure.

CEDA CONTACT DETAILS

CEDA-BADC
RAL Space – R25 – 1.121
STFC Rutherford Appleton Laboratory
Harwell Science & Innovation Campus
Didcot
Oxfordshire
OX11 0QX
Telephone: +44 (0) 1235 446432
Fax: +44 (0) 1235 446314
e-mail: badc@rl.ac.uk
Home page: http://badc.nerc.ac.uk/

CEDA-NEODC
RAL Space – R25 – 2.28
STFC Rutherford Appleton Laboratory
Harwell Science & Innovation Campus
Didcot
Oxfordshire
OX11 0QX
Telephone: +44 (0) 1235 778123
Fax: +44 (0) 1235 446314
e-mail: neodc@rl.ac.uk
Home page: http://neodc.nerc.ac.uk/

ANNEX 1: CURRENT CEDA-BADC DATA SETS

All 232 data sets currently held by the BADC are listed below.

- ACSOE/ACE - HILLCLOUD-1 and HILLCLOUD-2
- ACSOE/MAGE - Eastern Atlantic Experiment s (EAE-96 and EAE-97)
- ACSOE/OXICOA - Eastern Atlantic Spring/Summer Experiments (EASE-96 and EASE-97)
- ACSOE/OXICOA - Free Troposphere Experiments (FREETEX-96 and FREETEX-98)
- ACSOE/OXICOA - OZPROF
- ACSOE/OXICOA - Testing Atmospheric Chemistry In Anticyclones (TACIA) C-130 data
- Aerosol and Chemical Transport in Tropical Convection (ACTIVE)
- African Monsoon Multidisciplinary Analysis (AMMA)
- Airborne Antarctic Ozone Experiment (AAOE-87)
- Airborne Arctic Stratospheric Expedition (AASE)
- Airborne Arctic Stratospheric Expedition II (AASE II)
- Airborne Southern Hemisphere Ozone Experiment (ASHOE) / Measurement for Assessing the Effects of Stratospheric Aircraft (MAESA)
- APPRAISE - Aerosol Properties, PRocesses And Influences on the Earth's climate
- Arctic Biosphere-Atmosphere Coupling at multiple Scales (ABACUS)
- ARDAAOS - Reading Assimilated Atmospheric Satellite Data
- ARDAAOS - The Cambridge Chemical Assimilation Data
- Berlin Stratospheric Data Series
- Bolton Experiment
- BORTAS: Quantifying the impact of BOReal forest fires on Tropospheric oxidants over the Atlantic using Aircraft and Satellites
- British Antarctic Survey - High Resolution Radiosonde Data
- Cascade - Scale interactions in the tropical atmosphere.
- Chemistry of the Antarctic Boundary Layer and the Interface with Snow (CHABLIS)
- Chilbolton Facility for Atmospheric and Radio Research (CFARR)
- Climate Impacts LINK Project
- Climateprediction.net
- Climatology Interdisciplinary Data Collection (CIDC)
- Cloud and Water Vapour Experiment for Model Comparisons at Chilbolton (CWAVE)
- Cloud Archive User Service data (CLAUS)
- CLoud, Aerosol Characterisation Experiment in the Free Troposphere (CLACE)
- CLOUDMAP2 ATSR cloud products
- Convective and Orographically-induced Precipitation Study (COPS)
- Convective Storm Initiation Project (CSIP)
- CORRAL - UK COLONIAL REGISTERS AND ROYAL NAVY LOGBOOKS
- Cospar International Reference Atmosphere (CIRA-86)
- Coupled Ocean Atmosphere and European Climate (COAPEC)
- CRU Data sets - CRU TS 3.0 Time-Series
- Cryogenic Limb Array Etalon Spectrometer (CLAES L3)
- CRYOspheric STudies of Atmospheric Trends (CRYOSTAT)
- CWVC - Chilbolton Advanced Meteorological Radar (CAMRa) data

- CWVC - Egrett Microphysics Experiment, with Radiation, Lidar and Dynamics campaigns (EMERALD-1 and EMERALD-2)
- CWVC - Global Retrieval of ATSR Cloud Parameters and Evaluation (GRAPE)
- CWVC - HITRAN water vapour absorbtion
- Earth Radiation Budget Experiment (ERBE)
- ECMWF 15-year re-analysis data (ERA-15)
- ECMWF 40-year re-analysis data (ERA-40)
- ECMWF ERA-Interim re-analysis data (ERA-Interim)
- ECMWF Operational Analyses
- ECMWF Trajectories
- Effective Atmospheric Angular Momentum (EAAM)
- European Arctic Stratospheric Ozone Experiment (EASOE)
- European eXport of Precursors and Ozone by long-Range Transport (EXPORT)
- European Space Agency (ESA) - Measurement of H2O Absorption Cross-Sections
- Eyjafjallajokull - Volcanic Ash Cloud Measurements
- FAAM - Aerosol Direct Radiative Impact Experiment (ADRIEX)
- FAAM - Autumn and Winter Experiments (AUTEX / WINTEX)
- FAAM - Cirrus and Anvils: European Satellite and Airborne Radiation measurements (CAESAR)
- FAAM - Continuum Absorption in the Visible and Infrared and its Atmospheric Relevance (CAVIAR)
- FAAM - Contrail Forecast Verification Experiment (COVEX)
- FAAM - Dust and Biomass EXperiment (DABEX)
- FAAM - European AQUA Thermodynamic Experiment (EAQUATE)
- FAAM - Flux Experiment (FLUXEX)
- FAAM - Ice and Precipitation Initiation in Cumulus (ICEPIC)
- FAAM - Ice Nuclearisation in Wave Clouds (NU-WAVE)
- FAAM - Joint Airborne IASI Validation Experiment (JAIVEX)
- FAAM - MICROwave investigation of MIXed phase cloud (MICROMIX)
- FAAM - NEON Infra-Red Camera
- FAAM - Production of Ozone of South-east England (POSE)
- FAAM - Rain in Cumulus over the Ocean (RICO)
- FAAM - Terrain-induced Rotor EXperiment (T-REX)
- FAAM - VOCALS-UK - VAMOS (Variability of the American Monsoon System) Ocean Cloud Atmosphere Land Study Regional Experiment
- FAAM - CCOntrails Spreading into Cirrus (COSIC)
- Facility for Airborne Atmospheric Measurements (FAAM)
- Firn Record of Trace Gases Relevant to Atmospheric Chemical Change over 100 yrs (FIRETRACC/100)
- FREE - A data-driven exploratory study of extreme events based on joint probability analysis
- FREE - A hybrid model for predicting the probablity of very extreme rainfall
- FREE - Changing coastlines: data assimilation for morphodynamic prediction and predictability
- FREE - Coastal Flooding by Extreme Events (CoFEE)
- FREE - Ensemble Prediction of Innundation Risk and Uncertainty arising from Scour (EPIRUS)
- FREE - Exploitation of new data sources, data assimilation and ensemble techniques for storm and flood forecasting
- FREE - FLoAT - Responding to the June/July Flood Events in the UK

- FREE - FRACAS: a next generation national Flood Risk Assessment under climate ChAnge Scenarios Project
- FREE - Identification of changing precipitation extremes and attribution to atmospheric, oceanic and climatic changes
- FREE - Land Use Management Effects in Extreme Floods
- FREE - Local flood forecasting capability for fluvial and estuarine floods: Use of GridStix for constraining uncertainty in predictive models
- FREE - Modelling groundwater flood risk in the Chalk aquifer from future extreme rainfall events
- FREE - Quantifying Flood Risk of Extreme Events using Density Forecasts Based on a New Digital Archive and Weather Ensemble Predictions
- FREE - Uncertainty Assessments of Flood Inundation Impacts: Using spatial climate change scenarios to drive ensembles of distributed models for extremes
- Geostationary Earth Radiation Budget Experiment (GERB)
- Global Ocean Surface Temperature Atlas Plus (GOSTAplus)
- Global Ozone Monitoring Experiment (GOME)
- Global Sea Level Observing System (GLOSS)
- Greenhouse Effect Detection Experiment (GEDEX)
- Greenland Flow Distortion EXperiment (GFDex)
- HadCM3 Control Run Model Data
- Halogen Occultation Experiment (HALOE L2 and L3 Version 19)
- HiGEM - High Resolution Global Environmental Modelling
- High Resolution Dynamics Limb Sounder (HIRDLS)
- Hydrological Radar Experiment (HYREX)
- Impact of combined iodine and bromine release on the Arctic atmosphere (COBRA)
- Improved Air Quality Forecasting (ISB52)
- Improved Stratospheric and Mesospheric Sounder (ISAMS L2)
- Improved Stratospheric and Mesospheric Sounder (ISAMS L3)
- International Satellite Cloud Climatology Project C2 data set (ISCCP-C2)
- International Satellite Cloud Climatology Project D1 data set (ISCCP-D1)
- International Satellite Cloud Climatology Project D2 data set (ISCCP-D2)
- International Satellite Land Surface Climatology Project - Initiative I data collection (ISLSCP I)
- International Satellite Land Surface Climatology Project, Initiative II (ISLSCP II)
- IPCC Data Distribution Centre
- IUPAC Evaluated Gas Kinetic and Photochemical Data
- JET2000
- Limb Infrared Monitor of the Stratosphere (LIMS)
- Met Office - Cardington Data
- Met Office - European Synoptic stations data (1990 - 1996)
- Met Office - GISST/MOHMATN4/MOHSST6 - Global Ice coverage and SST (1856-2006)
- Met Office - Global Mean Sea-Level Pressure data sets (GMSLP and HadSLP1)
- Met Office - Global Radiosonde Data
- Met Office - Global Radiosonde Gridded Temperature Anomalies (1958-Jul.2004) – HadRT
- Met Office - Globally gridded radiosonde temperature anomalies (1958 to present) - HadAT
- Met Office - HadISST 1.1 - Global sea-Ice coverage and SST (1870-Present)
- Met Office - HadSST2 - uninterpolated sea surface temperature (1850-present)
- Met Office - Historical Central England Temperature (CET) Data

- Met Office - Land Surface Stations data (1900-2000)
- Met Office - Mean Sea Level Pressure (MSLP) Charts
- Met Office - MIDAS Land Surface Stations data (1853-current)
- Met Office - Northern Hemisphere Geopotential Height (1945-2005)
- Met Office - Northern Hemisphere Mean Sea Level Pressure (MSLP) fields (1873-2005)
- Met Office - Rain radar products (NIMROD)
- Met Office - Stratospheric Assimilated Data
- Met Office - TOVS Stratospheric Analyses
- Met Office - UK High Resolution Radiosonde Data
- Met Office - Operational NWP Data Products (UM)
- Met Office - Cyclone database
- Met Office Hadley Centre HadCM3 model integrations
- Met Office Hadley Centre HadCM3-C model integrations
- Met Office Hadley Centre HadGEM1 model integrations
- Met Office Hadley Centre HadRM3 PPE model integrations
- Met Office Met. Research Flight C-130 data
- Met Office MetDB data
- Met Office Wind Profiler data (1998-onwards)
- Meteosat Images of Europe
- Meteosat Second Generation (MSG)
- Microwave Limb Sounder (MLS) prototype water vapour data
- modis MCD12Q1 land cover type
- NCAS Facility for Ground based Atmospheric Measurements (FGAM)
- Network for the Detection of Atmospheric Composition Change (NDACC)
- North Atlantic Marine Boundary Layer EXperiment (NAMBLEX)
- Oxidant & Particle Photochemical Processes above a South-East Asian tropical rain forest (OP3)
- PML ocean properties from SeaWiFS/SeaStar (QUEST/CASIX, 2009)
- Polluted Troposphere - AMPEP
- Polluted Troposphere - CLOPAP
- Polluted Troposphere - Ionisation as a precursor to aerosol formation
- Polluted Troposphere - OVOCS and NMHCs in the polluted troposphere
- Polluted Troposphere - TORCH
- Polluted Troposphere - Tranport and mixing in fronts
- QUEST - Quantifying ecosystem roles in the carbon cycle (QUERCC)
- QUEST - Climate-carbon modelling, assimilation and prediction (CCMAP)
- QUEST - Deglaciation
- QUEST - Dynamics of the Earth System and the Ice-Core Record (DESIRE)
- QUEST - Dynamics of the PETM (PETM)
- QUEST - Fire Modelling and Forecasting System (FireMAFS)
- QUEST - Marine Biogeochemistry and Initiative in QUEST (MarQUEST)
- QUEST - Quantifying the influence of biogeochemical feedbacks on climate change (Feedbacks QUEST)
- QUEST - Quantifying the potential of terrestrial biomass to mitigate climate change (QUATERMASS)
- QUEST - Quaternary QUEST
- QUEST - QUEST Atmospheric Aerosols and Chemistry (QUAAC)
- QUEST - QUEST Fish

- QUEST - QUEST Global- scale impacts of climate change (GSI)
- QUEST - Using palaeodata to reduce uncertainties in climate prediction (PalaeoQUMP)
- RAL Molecular Spectroscopy Facility (MSF)
- RAPID - ISOMAP UK
- RAPID - Arctic regulation of the thermohaline circulation (ARTHER)
- RAPID - Assimilation in ocean and coupled models to determine the thermohaline circulation
- RAPID - Attribution of ocean climate change signals in the Atlantic
- RAPID - Can Younger Dryas atmospheric 14C concentration be attributed to North Atlantic surface ocean ventilation?
- RAPID - Circulation, overflow, and deep convection studies in the Nordic Seas using tracers and models
- RAPID - Impact of changing freshwater flows on the thermohaline circulation and European climate - analysis and modelling of the last deglaciation
- RAPID - Improving our ability to predict rapid changes in the El Nino Southern Oscillation climatic phenomenon
- RAPID - Mass balance and freshwater contribution of the Greenland ice sheet: a combined modelling and observational approach
- RAPID - Predictability of rapid climate change associated with the Atlantic thermohaline circulation
- RAPID - Processes controlling dense water formation and transport on Arctic continental shelves
- RAPID - Punctuated disintegration of the NW European Ice Sheet and rapid climate change
- RAPID - Quantitative applications of high-resolution late Holocene proxy data sets: estimating climate sensitivity and thermohaline circulation influences
- RAPID - The atmospheric water vapour budget and its relevance to the thermohaline circulation
- RAPID - The impact of climate change on the North Atlantic and European storm-track and blocking
- RAPID - The Probability of Rapid Climate Change
- RAPID - The Role of Air-Sea Forcing in Causing Rapid Changes in the North Atlantic Thermohaline Circulation
- RAPID - The role of salinity in ocean circulation and climate response to greenhouse gas forcing
- RAPID - The role of sloping topography in the overturning circulation of the North Atlantic
- RAPID - The role of the cryosphere on modulating the thermohaline circulation of the North Atlantic
- RAPID - To what extent was the Little Ice Age a result of a change in the thermohaline circulation?
- RAPID - Understanding uncertainty in simulations of THC-related rapid climate change
- RAPID-WATCH - Change in the Atlantic Atmosphere-Ocean System (ChAAOS)
- RAPID-WATCH - Meridional Overturning circulation at 26N and the North Atlantic heat COntent (MONACO)
- RAPID-WATCH - Risk Assessment, Probability and Impacts Team (RAPID-RAPIT)
- RAPID-WATCH - The Value of the RAPID array for climate predictions (VALOR)
- RAPID-WATCH - What are the roles of natural and human drivers in historical changes in the Atlantic Overturning Circulation?
- ROle of Nighttime chemistry in controlling the Oxidising Capacity of the AtmOsphere (RONOCO)
- Sea Surface Temperatures from the Along Track Scanning Radiometer (ATSR-1) - 1991-1995
- Southern Ocean Atmospheric Photochemistry Experiment 2 (SOAPEX-2)

- Stratosphere-Troposphere Exchange Project (STEP)
- Stratospheric Aerosol and Gas Experiment II (SAGE II)
- Stratospheric Aerosol and Gas Experiment III (SAGE III)
- Stratospheric Aerosol Measurement II (SAM II)
- Stratospheric Photochemistry, Aerosols and Dynamics Expedition (SPADE)
- Surface Ocean / Lower Atmosphere Study (UK SOLAS)
- Surface Radiation Budget (SRB)
- The Armagh Observatory Climate Data
- The NERC Mesosphere-Stratosphere-Troposphere (MST) Radar Facility at Aberystwyth
- The Polar Pathfinder Sampler: Combined AVHRR, SMMR-SSM/I and TOVS Time Series
- Total Ozone Mapping Spectrometer (TOMS) - CDs version 7
- Total Ozone Mapping Spectrometer (TOMS) and Ozone Monitoring Instrument (OMI)
- UARS Microwave Limb Sounder (MLS L3)
- UGAMP Ozone Climatology
- UK-Japan Climate Collaboration (UJCC)
- Universities Facility for Atmospheric Measurement (UFAM)
- URGENT - An Instrumented Aircraft Facility to Provide Vertical Profiles of Wind, Temperature, Turbulence, Sensible Heat, Aerosol and Trace-Gas Concentrations and Fluxes within the Urban Boundary Layer (PROFIL)
- URGENT - Observation, Modelling And Management Of Urban Air Pollution (PUMA COnsortium - PUMACO)
- URGENT - PHYsicochemistry and TOXicity (PHYTOX)
- URGENT - Tracers and Dispersion of GASeous POLlutants (GASPOL)
- URGENT - Universities Weather Research Network (UWERN) Urban Meteorology Programme (URBMET)
- UTLS - Anthropogenic influence on UTLS clouds and aerosol (CIRRUS)
- UTLS - Atmospheric Chemistry and Transport of Ozone in the UTLS (ACTO)
- UTLS - Dynamics and chemistry of frontal zones, DCFZ
- UTLS - Evaluation of the ozone and water vapour data sets of the 40 year European re-analysis of the global atmosphere
- UTLS - Extension of THESEO balloon-borne measurements
- UTLS - International Transport of Ozone and Precursors (ITOP-UK)
- UTLS - Ozone and water vapour measurements in the tropopause region
- UTLS - SLIMCAT Reference Atmosphere for UTLS-Ozone
- UTLS - The Aberystwyth Egrett experiment
- VIRTEM Validation of IASI Radiative Transfer: Experiments and Modelling
- Weybourne Atmospheric Observatory
- World Land Surface Temperature Atlas (WLSTA) (1992-1993)

ANNEX 2: CURRENT CEDA-NEODC DATA SETS

All 24 data sets currently held by the NEODC are listed below.

- LANDSAT-4 MSS data
- LANDSAT-4 TM data
- LANDSAT-5 TM data
- LANDSAT-7 ETM data
- ESA (A)SAR data set
- ENVISAT- Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY)
- ENVISAT-Michelson Interferometer for Passive Atmospheric Sounding (MIPAS)
- ENVISAT-MERIS - MEdium Resolution Imaging Spectrometer (MERIS)
- Global Ozone Monitoring Experiment-2 (GOME-2) on EPS Metop
- Advanced Very High Resolution Radiometer-3 (AVHRR-3) on EPS Metop
- Infrared Atmospheric Sounding Interferometer (IASI) on EPS Metop -
- (A)ATSR multimission archive covering ATSR-1, ATSR-2 and AATSR in ENVISAT format
- ATSRUBT - ATSR-1 and -2 Ungridded Brightness Temperature (UBT) archive
- AVHRR-FASIR - AVHRR FASIR data
- ARSF - NERC ARSF - Airborne Research and Survey Facility
- NCAVEO-FIELD - NCAVEO Field Experiment at Chilbolton, June 2006
- Land Cover Map 2000 data for NCAVEO UK Test Sites (NCAVEO-LCM2000)
- NCEO - CASIX - CASIX - Centre for observation of Air-Sea Interactions & fluXes
- NCEO - Kriged TOPEX data (CASIX)
- NCEO - SeaWiFS primary production (CASIX)
- NCEO - Atmospheric profiles retrieved by Oxford from ENVISAT/MIPAS
- NCEO - SEVIRI-FRP - Fire Radiative Power data from MSG SEVIRI
- NEXTMap Britain digital terrain mapping of the UK
- SHAC-2000 - SAR and Hyperspectral Airborne Campaign (SHAC), 2000